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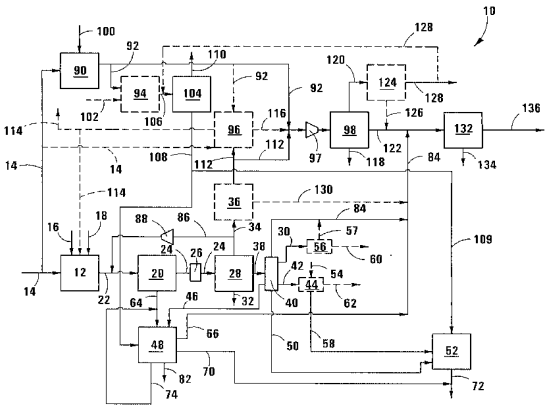
(54) **Title:** CO-PRODUCTION OF HYDROCARBONS AND DIMETHYL ETHER



$$SN = \frac{[H_2] - [CO_2]}{[CO] + [CO_2]} \quad (I)$$

(57) **Abstract:** A process for co-producing hydrocarbons and dimethyl ether (DME) includes feeding a gaseous feedstock comprising hydrogen and carbon monoxide, into a threephase low temperature catalytic Fischer-Tropsch reaction stage, allowing the hydrogen and carbon monoxide partially to react catalytically in the Fischer-Tropsch reaction stage to form hydrocarbons, and obtaining a tail gas from the Fischer-Tropsch reaction stage which includes unreacted hydrogen and carbon monoxide and also carbon dioxide. The composition of at least a portion of the tail gas is adjusted to provide a DME synthesis feedstock with a syngas number (SN) between 1.8 and 2.2, where formula (I) and where $[H_2]$, [CO] and $[CO_2]$ respectively are the molar proportions of hydrogen, carbon monoxide and carbon dioxide in the DME synthesis feedstock. The DME synthesis feedstock is fed into a DME synthesis stage for conversion.

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